January 14, 2001

In October 2001, more than 300 attendees gathered for two days in Washington, D.C. at the National Summit on Broadband Deployment to discuss the state of U.S. broadband deployment. The conference was sponsored by the National Association of Regulatory Utility Commissioners and the National Exchange Carrier Association with generous support from sixteen trade associations and companies.

The conference had over 50 presenters and keynote speakers, including U.S. Senator Patty Murray, FCC Chairman Michael Powell, FCC Commissioners Kathleen Abernathy, Michael Copps and Kevin Martin, Assistant Commerce Secretaries Nancy Victory and Bruce Mehlman, and Rural Utility Service Administrator Hilda Gay Legg.

The Summit provided a neutral forum for federal and state policymakers, industry participants, consumer groups and other stakeholders to discuss the state of broadband deployment and identified policies and ideas in the broadband debate.

The Summit highlighted a number of important themes and key issues for state and federal policymakers working on broadband deployment issues. This document contains a summary of the key themes and issues emerging from the Broadband Summit. It also summarizes each of the plenary and breakout sessions.

This document is being filed in the FCC's pending third annual review of broadband deployment and in the National Telecommunications and Information Agency's pending broadband docket.

This document is the work of one of the conference organizers, who is solely responsible for its content. Any comments or corrections to this document are welcome. They may be sent to Commissioner Brett Perlman at the Public Utility Commission of Texas at (512) 936-7018 (fax) or Brett.Perlman@puc.state.tx.us

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Key Themes

Theme #1: The conference helped to refine the definition of "Broadband".

The FCC's currently defines broadband as infrastructure capable of delivering a speed of 200 kilobits per second (kbps).

Many argued that while this definition is helpful it is inadequate. Keynote speaker Les Vadasz of Intel suggested that 100 megabits per second (mbps) to 100 million homes should be a policy goal. 100 Mbps to the home could jumpstart the development of a new generation of content-rich applications.

Others viewed broadband as not about bigger, faster Internet connections but about new video and other applications that use those connections.

FCC Chairman Michael Powell stated that broadband "should be viewed holistically as a technical capability that can be matched to consumers' broad communication, entertainment, information and commercial desires." Keynote speaker David Clark of MIT agreed that broadband deployment could be thought of as the process of providing users a sufficient capability so that one's Internet connection does not limit the user's experience in running an application over the Internet.

Some participants thought that broadband may ultimately be defined as "critical infrastructure" which is "something everyone uses and doesn't notice, except when it is broken."

Theme #2: The Broadband Summit highlighted two competing visions for Broadband deployment.

One vision argues that there are large externalities to broadband deployment, suggesting that universal broadband deployment could create $500 billion gains in consumer welfare and productivity. Advocates for this vision believe that the U.S. needs a national broadband policy, perhaps one that seeks to provide 100 Mbps to 100 million households by the end of the decade.

The advocates of this view contend that a classic "chicken and egg" dilemma confronts broadband: content developers and venture capitalists will not invest ahead of demand. These advocates suggest that network industries require standards before widespread technology adoption occurs. Access to broadband services is also essential for further growth and development in the fields of telemedicine and education.

The second vision focuses on consumer demand, suggesting that broadband adoption is more a "marketing failure" than a market failure. Consumers will purchase broadband when killer applications emerge.

These advocates point out that deployment rates for cable modems exceed 75 percent and that DSL deployment rates are around 45%, but that technology adoption rates remain around 10 percent. Some highlighted that looking at solely at broadband penetration among computer users indicates higher penetration rates.

The Summit suggested several questions for policy makers: Is broadband deployment a supply problem or demand problem or not a problem at all? Do we need a national broadband deployment policy or should we be skeptical of those arguing for a national policy?

Theme # 3: The conference developed a common set of facts regarding the current state of broadband deployment.

Consumer adoption rates for broadband show faster growth rates than other telecom services (such as the telephone, the Internet or cellular). At the same time, differences exist in consumer adoption rates among groups when segmented by geography, income and ethnicity.

Carrier deployment statistics also show high overall national deployment levels. Some type of broadband service is available 75 percent of U.S. zip codes, where 96 percent of the U.S. population lives in these areas. On the other hand, not everyone in these areas has broadband access. Deployment has been highly concentrated and a substantial number of households do not have broadband access.

Conference also examined prospects for new telecommunications investment. Following this year's large decline in telecom market values, many panelists thought that new investment in telecommunications could be scarce for the next two years. On the other hand, some believed that the market is underestimating 10-year growth just as it overestimated early demand.

Many participants agreed that new investment will be required because current deployment methods are interim measures with additional fiber deployment required for video and other high bandwidth applications.

According to a recent OECD Study, current statistics place the U.S. 5th in worldwide broadband deployment. Countries, such as Korea and Canada, rank higher than the U.S. in broadband deployment. Korea's highly dense urban population and its government policy have resulted in high broadband penetration. Canada, also a leader in broadband deployment, has adopted a national policy to make broadband available to all citizens by 2005.

Theme # 4: The conference highlighted the argument over what regulatory regime should apply to broadband deployment.

The ILECs are advocating that a different regulatory regime should apply to new telecommunication investment. The ILECs state, "New rules should apply to new

wires." CLECs and ISPs argue that this argument is just the latest ILEC attempt to undermine the framework of the 1996 Federal Telecommunications Act, that it is impossible to separate old wires from new wires, that they would be denied access to end use customers under the "new rules" framework. They state that Congress, the FCC and the states should reject this approach and that what better enforcement of the FTA is all that is required.

The ILECs argue in return that they won't make new investments in telecommunications infrastructure without a new regulatory framework. On the other hand, a panel of financial analysts at the Summit noted that Wall Street and the VC community won't support new investment under the current economic climate and that the large ILECs have been drastically cutting their capital budgets due to current economic conditions, not regulation.

One possible solution to this debate was suggested by the new Computer Science and Telecommunication Board report that argues for "logical layer" (i.e. service unbundling) over physical unbundling.

Chairman Powell's speech indicated that a preference that broadband should exist in a "minimally regulated space" but also noted that regulatory policy should not foreclose competition.

Questions emerging from this theme are: Should state and federal policymakers develop a new regulatory approach, and if so, what should it look like?

Theme # 5: The Summit participants seemed to agree that whatever the issues regarding broadband deployment in metro and urban areas, broadband deployment in rural areas raises more difficult challenges.

Rural areas have lower population densities and some have lower income levels. Some pointed out that there are generally fewer choices (i.e., one bank, one gas station) in rural areas than in urban areas. Other panelists noted that there is a strong role for local planning in helping to promote broadband deployment. Some panelists highlighted communities that are overcoming these obstacles and developing new and innovative ideas, such as municipal fiber deployment models, community networking, demand aggregation and anchor tenancy, to drive broadband deployment.

The conference discussed an under-recognized problem impacting rural broadband deployment, the cost of transport. The recent NECA Middle Mile Cost Study focuses on the cost of transporting Internet traffic from an ISP operating in a rural telephone company's territory to an Internet backbone provider - the "middle mile." The results show that 54% of rural telco switches are more than 70 miles from an Internet backbone provider and that 14% are more than 200 miles away. The study stated, "these long distances combined with the lack of market size lead us to conclude that high-speed Internet services today may not be economically feasible in many rural areas."

Questions emerging from this theme are:

- Do rural areas require a different approach?
- Can best practice ideas be successfully replicated in other communities?
- What about municipal involvement in the broadband deployment?
- What are the issues in the middle mile and how should they be addressed?

Theme # 7: Conference speakers highlighted the important role of local governments in broadband deployment.

Some argued that local governments have impeded broadband deployment by causing excessive delays in obtaining franchises and building permits and by charging excessive right of way fees.

Others claim that local governments have an important role to play in encouraging broadband deployment, particularly in those rural and high cost areas where competition may not flourish. Such local initiatives resulted in electrification of thousands of communities, particularly in rural areas, that were unserved or underserved by the private sector. The participants disagreed, however, on whether local governments should also be able to provide broadband service in areas where the private sector is willing to enter.

Questions emerging from this session are:

How can we work together to identify all of these barriers? What role should the FCC play and what role should state regulators play in removing these regulatory barriers?

Theme # 8: Conference speakers identified other regulatory issues that could impede broadband deployment.

Most of the keynote speakers at the conference agreed that legal barriers could retard the deployment of broadband services. Presenters pointed to copyright issues, zoning and building codes. Others discussed the "regulatory underbrush" that may be impeding broadband deployment, such as accounting rules.

Others stated that new spectrum policies may be required to encourage the deployment of wireless broadband services.

Broadband Conference Session Summaries

Opening Session

NECA President Bob Anderson discussed the upcoming release of NECA's Middle Mile Cost Study. The study focuses on the cost of transporting Internet traffic from an ISP operating in a rural telephone companies territory to an Internet backbone provider - the "middle mile." The study focuses on the cost of transporting Internet traffic from an Internet Service Provider (ISP) operating in a rural telephone company's territory to an Internet Backbone Provider (IBP). The results show that 54% of rural telco switches are more than 70 miles from an IBP node: 14% are more than 200 miles away. Anderson stated, "these long distances combined with the lack of market size lead us to conclude that high-speed Internet services today may not be economically feasible in many rural areas."

Intel Capital President Les Vadasz suggested that the U.S. might be falling behind other countries in broadband deployment and set a goal to connect 100 million households with 10 Mbps of broadband capacity in 10 years. Vadasz stated that current internet infrastructure is inadequate for new broadband applications, but that the industry is currently stuck in a "chicken and egg" dilemma in which new applications will emerge only after mass broadband deployment. Broadband deployment has missed its forecasts due to provisioning and cost issues. Policymakers should adopt policies that remove regulatory bottlenecks and encourage investment.

MIT Research Scientist David Clark reacted to Vadasz' vision, suggesting that broadband deployment should be viewed as a process. He noted that local efforts can help to deploy broadband and that new models for financing broadband deployment, such as using municipal bond financing or home mortgages, should be explored.

Keynote Sessions

Senator Patty Murray spoke about the difficulties in bringing broadband to rural areas in her state. She discussed a bill (S.1056) that she has sponsored that would provide grants to local governments that would allow them to do the necessary community planning, such as creating a business plan before attempting to roll out advanced services in their communities.

NTIA Administrator Nancy J. Victory spoke about the role government can play in promoting broadband deployment. She discussed Administration initiatives such as R&D tax credits and an E-Government initiative fund, and discussed whether there is a further role that government can play in removing obstacles to broadband deployment. She stated that the Administration's broadband policy is a "work in progress" but stressed that the Administration's goals are to remove roadblocks to deployment, to favor facilities based solutions as well as competitive resale solutions, to regulate in a technology neutral manner, and to have effective enforcement. To help develop the Administration's policy in this area, NTIA expects to release a Request for Comment in the near future. As part

of this process, NTIA looks forward to working collaboratively with state and local governments. http://www.ntia.doc.gov/ntiahome/speeches/2001/broadband_102501.htm

FCC Chairman Michael Powell gave an address in which he outlined the FCC's policies and stressed that the measure of success should be deployment to all areas and not just consumer take rates. He discussed the importance of not imposing a common carrier regulatory scheme on the numerous different technologies and delivery methods that constitute "broadband". http://www.fcc.gov/Speeches/Powell/2001/spmkp110.html

Assistant Secretary for Technology Policy Bruce Mehlman addressed two key questions: whether the pace of deployment is adequate and whether low adoption broadband rates indicate a market failure or a marketing failure. Mehlman stated that broadband subscription grew 158% percent in 2000 and is estimated to grow 90% in 2001. Mehlman stated that supply exceeds demand for broadband and that it appears that some regulatory barriers are impeding further deployment. Government's role should be to educate the public, lead by example and develop best practice deployment models.

Rural Utility Service Administrator Hilda Gay Legg discussed the agency's commitment to bring broadband to rural areas and she announced that the one year pilot program to fund rural broadband deployment has been added to the administrations budget for next year and, if approved, the pilot program will become permanent. For more information on the Rural Utilities Service visit: http://www.usda.gov/rus/index2/welcome.htm

FCC Commissioner Kathleen Abernathy discussed the state of broadband deployment and suggested that it was not a crisis in deployment as much as a low take rate that was slowing down broadband. She discussed the ways that government could make broadband more affordable to rural and low income Americans including expanding tax incentives and the Schools and Libraries program. She indicated that the FCC is looking for additional spectrum that could be used for advanced services. For more information, visit her homepage at http://www.fcc.gov/commissioners/abernathy/welcome.html

FCC Commissioner Michael Copps discussed the need to increase the use of broadband for education, commerce, healthcare, telecommuting and other services that we cannot yet imagine. He indicated that government playing a role is not always a bad thing. If there is to be widespread deployment and use of broadband it will take the assistance of the public, the private sector, Federal, State and local government all working together. For complete text visit: http://www.fcc.gov/Speeches/Copps/2001/spmjc107.html

FCC Commissioner Kevin Martin in his remarks stated, "Encouraging broadband deployment should be a fundamental priority of Commission and government in general". He discussed the necessity of removing financial disincentives to deployment; the need to focus on facilities based competition and the need to establish a stable, reliable and fast regulatory environment to foster broadband deployment. For complete text visit: http://www.fcc.gov/Speeches/Martin/2001/spkjm101.html

Plenary Sessions

Best Practices in Broadband Deployment from the States

This session provided best practice examples of broadband deployment from across the nation. These ideas focused on strategic planning, demand aggregation, and community networks and municipal fiber deployment.

Leadership and strategic planning are common threads among successful broadband deployment projects. Each of the projects succeeded because of the presence of a local champion to lead the effort. The session highlighted simple tools, such as the Computer Systems Policy Project's "readiness guide," which allows communities to start measuring "connectiveness" and develop plans to increase connectivity.

State leadership is also responsible for Florida's successes. The state's IT Task Force has developed a series of initiatives (such as the Florida Power Up program which develops community technology centers and the Florida Network Access Point which increase Internet access) to promote the deployment of advanced services.

The session also highlighted several successful deployment strategies. Programs such as the Massachusetts Connect programs have used demand aggregation strategies to facilitate deployment. These programs use community demand to guarantee a return to a provider for making a facilities-based telecommunications investment.

Other programs such as Colorado's Beanpole project overcomes "DDT" (Distance Density Terrain) by using government as an anchor tenant in a demand aggregation project. The Beanpole project requires community planning. Need to help communities develop a vision for telecommunications.

Community networks are doing what the REA did 20 years ago. The Blacksburg Electronic Village, the nation's largest community network, has designed a new model called the Multimedia Service Access Point that aggregates load and allows ISPs to co-locate and share deployment costs. Similarly, the "Adirondack Area Network" has built a large-scale network to share the costs of broadband deployment.

The Great Debate: Regulation v. Competition

This session drew on the experiences of industry stakeholders and regulators to assess the current state of broadband deployment. Among the issues discussed were:

- State of the Broadband Market:

  Some suggested that there is an increasing awareness that deployment is not the problem because cable and DSL are becoming widely available, while adoption rates remain low. Others stated that the U.S. is falling behind in establishing a goal of widespread high-speed access. These participants stated that true

broadband applications require 100 Mbps to the home and industry players will need to invest significant resources in the deployment of fiber into the residential areas.

Some stated that there appear to be two competing visions for broadband. One vision says that broadband is a natural monopoly and the role of government is to guarantee open access. The other vision believes that broadband is emerging in an open network environment. In this environment, the question is what regulations are needed?

- Industry Strategies:

  Competitive industry representatives noted that the death of the competitive industry is overstated. Therefore, many competitive companies are conserving cash because Wall Street won't fund businesses on "the build it and they will come" strategy. Competitors are leasing the incumbent's facilities to build a customer base, similar to the strategy used by competitors to enter the long distance market, and will use the customer base to develop a business case for deploying a facilities based network. There is a disconnect: regulators want facilities, but VCs won't finance a "field of dreams" strategy.

  Large ILECs are willing to make investment in facilities needed to reach a goal of reaching 20 million customers, but will not do so if current unbundling rules are applied to new investment. New rules are needed to promote new investment in broadband deployment in remote terminals. Some CLEC representatives stated that it is difficult to separate new wires from old wires. There's only one set of wires and prices should be based on incremental costs. As a compromise, some suggested that regulators should not impose new rules on anyone and should remove regulations as markets open.

- Government Policies:

  The role of government in the emerging broadband market was debated. Many agreed that there was little need for new regulation and that competition was adequately disciplining the market.

  There is a clear dispute over what unbundling obligations and open access requirements should apply to broadband infrastructure. The telecom providers and some others argue that government should apply "new rules" to "new wires" and remove unbundling obligations from new broadband investment. They claim that the elimination of sharing obligations would spur broadband deployment. The incumbent telecom providers stated that they are willing to open up the network but not at TELRIC-based rates.

Others stated that the FCC should not apply common carrier obligations to cable facilities. The cable providers stated that they are voluntarily opening their networks to multiple ISPs in response to market incentives, not government fiat.

Others argued that regulators have a role to play in ensuring non-discriminatory access to broadband networks. Consumer advocates stated that bottleneck monopolies should remain regulated and pricing should be at incremental costs. Similarly, both large and small ISPs stated that they face a number of constrains imposed by both incumbent telcos and cable companies.

Many participants agreed that government policies should recognize that rural areas are different than urban areas and will require a different set of rules. There may be very specific areas where targeted incentives or other special mechanisms are needed to promote deployment.

Breakout Sessions

Where are we on Broadband Deployment?

This session focused on current broadband deployment statistics, both on the consumer adoption rates and on carrier deployment data.

Consumer adoption rates for broadband show faster growth rates than other telecom services (such as the telephone, the Internet or cellular). FCC subscribership data shows that 7.1 million broadband lines (with 3.6 million cable modem users, 2.0 million DSL users and 1.5 million T-1 customers). A recent McKinsey and Company study shows that, at current prices, broadband penetration could rise to 38% (even with existing supply constraints). The study concluded that broadband could reach 57% of online households by year-end 2005.

The panel agreed that differences exist in consumer adoption rates among groups when segmented by geography, income and ethnicity. Department of Commerce's "Falling Through the Net" survey (the most comprehensive source available) shows that high-speed Internet access varies in rural and urban areas with 7.3% subscribing in rural areas and 12.2% in central city areas. Similarly, the FCC's data shows that 98% of most dense zip codes and 37% of least dense zip codes have high-speed subscribers.

The data also shows that high-speed access correlates positively with income and ethnicity. Among ethnic groups, the Department of Commerce data shows that Asians have the highest percentage penetration and Hispanics have the lowest. The FCC data shows that 96.1% of richest zip codes and 56% of poorest zip codes have high-speed subscribers.

Carrier deployment statistics show high overall national deployment levels. The FCC's data shows that broadband covers 75 percent of the zip codes in the U.S. and 96 percent of the population lives in those zip codes. Carrier deployment varies by geography.

On the other hand, the panelists agreed that deployment has been highly concentrated in urban areas. DSL currently passes 48 million homes. The ILECs have deployed in areas with up to 2500 homes/central office, which is 65 to 70% of the central offices, but can serve only 50% of homes within those central offices. Residential DSL prices have become stable, as CLEC have faded from the market, which is an indication that there is a lack of competitive pressure.

The next round of carrier deployment will focus on one of two options: Option 1 is to extend DSL to 21.6 million homes. Option 2 is a new build strategy that will extend DSL to 12.1 million homes.

There is a need for additional tools to understand deployment. Two different mapping projects were discussed. The Ohio Supercomputer mapping project shows the location of broadband deployment. These maps incorporate geographical information system and can overlay census data. The Ohio maps show that 80% of population has access to broadband. Another data set is looking at the entire U.S. for 1994 - 2000, focusing on frame relay, packet switching and optical carrier (OC) technology.

Broadband Industry Deployment Strategies

Panelists representing RBOCs, ILECs, large and small cable companies, CLECs, and suppliers all agreed that customer demand for broadband exists and is growing rapidly.

Consumers want competitive choices by providers and want the option to shop around for bundled services. Some companies are focusing on reduced prices through bundling of services, while others are marketing their service by providing a local office with local telephone representatives calling on businesses.

While current deployment methods differ among providers, all agree that fiber deployment is the end game for broadband with wireless or satellite being the most cost effective way to serve remote locations.

There are economic, technical and regulatory challenges to overcome in reaching this goal. With many investors having already been burned in these markets, industry participants agreed that the broadband projects must be based on a workable financial model.

Some panelists suggested that regulatory reform is needed to provide incentives to carriers to increase broadband penetration rates. As a result, rules on unbundling become even more important to the success of broadband. Some panelists suggest that incentives such as universal service funding, the Broadband Internet Enhancement Act, and regulatory forbearance will further the goal of advanced services to rural areas.

Despite these challenges, all segments of the broadband industry (RBOC, rural ILEC, Cable MSO, CLEC or small cable providers) are taking the financial risks to bring broadband to rural and urban America.

International Broadband Deployment: How does the U.S. Compare?

This panel compared broadband deployment in the U.S., which currently ranks 5th in broadband deployment in a recent OECD Study, to deployment in other countries.

The OECD study found that there is a mix of factors driving broadband deployment. Government policy, technological factors (such as ease of deployment), and competition are key drivers.

Korea leads the world in broadband deployment. Korea has seen a drastic increase in users over the past five years, over 50% of households subscribing to broadband. Korea now expects to have 8 million subscribers by the end of 2001 and 10 million by the end of 2002. A mix of technologies is being used in Korea; ADSL serves 55% of the subscribers, Cable 32% and LMDS (fixed wireless) 13%. Prices for broadband are about $25.

Korea's demographics help to explain the high penetration rates. Korea has high urban density with a large number of owner-occupied apartment buildings and a large upper to middle class population. The Korean media and IT industry were instrumental in heightening the general public's awareness of broadband capabilities and developing advance applications for the Internet.

Canada, also a leader in broadband deployment, has adopted a national policy to make broadband available to all citizens by 2005. While the demand for broadband is there, Canada's challenge is a vast geography and low population density.

The rest of the world has had less success with broadband deployment. The Asian experience in deployment has been very diverse with few clear success stories. The UK is lagging in their deployment of broadband services, primarily because of installation issues. The Netherlands is looking at subsidizing broadband end users in addition to service providers. Developing countries have a unique opportunity in that they can leap frog the upgrading of their embedded technologies to state of the art capabilities.

While Korea shows that broadband demand exists at the right price ($25/mo.), can Korea's success be replicated in other countries?

After the Fall: What broadband strategies will the financial community invest in next?

This panel of financial analysts focused on the question: What happened?

Panelists found many reasons for the telecom market collapse: overbuilding, ILEC deployment difficulties and bad business plans. Some believe that capital markets were not rational, looking at factors such as unit growth to justify investment, instead of relying on the existence or true potential of EBITA.

Many cited the lack of a clear "killer app" for broadband. They stated that there is no compelling content that currently requires broadband access.

The analysts felt that the worst may not yet be over. Venture capital investment has not hit bottom yet. It is expected to decline from $103 billion last year to $ 35 billion this year and to $20 billion next year. According to CS First Boston, of the 25 CLECs they track, 9 have defaulted on their high yield debt and another 14 are predicted to default by 2003.

The panelists agreed that incumbent telecom providers and cable providers the most likely winners in broadband. Some believed that that the ILECs are misfocused as they concentrate on regulatory battles when they should be focused on the business of profitable deployment. By recognizing this, the cable companies are winning the war for broadband rollout.

The panelists thought that investment in telecommunications could be scarce for the next two years. On the other hand, some believed that the market is underestimating 10-year growth just as it overestimated early demand.

Applications and Vertical Markets: How is Broadband being delivered to the Health Care, Education and Disabled Community

Access to broadband services is essential for further growth and development in the fields of telemedicine and education.

Broadband applications have become a necessary tool in today's society because health care services are not distributed equally throughout various geographic areas of this country.

Broadband access is an essential component to the education learning process and its effects on education are limitless. The E-rate has been a valuable program for the education community and has had far reaching benefits in the deployment of broadband to schools and libraries.

Some panelists suggested more attention from regulators and industry is needed in determining the impact that new emerging technologies have on the disabled community and the reality that this constituency is at risk of being left out of the broadband revolution.

How can spectrum policy accelerate Broadband deployment?

Wireless provision of advanced services may have the ability to transform regulation of wireline telecommunications and cable provision of advanced services. Main issues are the use of incentives, market prices, and flexible use of spectrum for new services.

Technology should be used to leverage use of spectrum allocations. Commercial uses of spectrum must not compromise national security.

Building the New Public Switched Network:

This session focused on new thinking for building broadband infrastructure.

The participants stated that broadband is critical infrastructure. "Critical infrastructure" is defined as "something everyone uses and doesn't notice, except when it is broken." The development of this new telecommunications infrastructure will be a long-term process.

Broadband is not about faster email, its about new applications. Broadband could also trigger new ways of social organizations. New services and applications all depend on broadband infrastructure. New applications are just emerging: instant messaging, networking, and home networking. Voice can be an application on a broadband network and will allow new services. New video applications are emerging: Tivo and Replay are early examples. Broadband will also be provided over new networks, like the 802.11b unlicensed wireless networks.

Speakers suggested several problems with current broadband policy. Financial markets won't fund new telecommunications infrastructure investment. We may end up with a duopoly. In most areas, it is unlikely to have more than 3 providers.

The session highlighted several possible solutions.

The recently released report of the Computer Science and Telecommunications Board concludes that there needs to be a shift from physical unbundling to "logical layer" unbundling.

The CSTB report notes that local policymakers should lead deployment by using public sector initiatives to foster market entry. New solutions, such as municipal networking or new deployment models using public utilities, municipalities, or having homeowners will own their own fiber, should be considered.

Structural separation may also be required because we still need copper loops and it's difficult to separate old wires and new wires.

Also, it was suggested that we should create a chicken to get some eggs: Stimulate demand through targeted tax credits.

Role of Local Governments in Broadband Deployment

This panel focused on two issues. Whether municipalities should enter the broadband market and right of way issues.

On municipal provision, the speakers agreed that local governments should be able to provide broadband service in areas where no other providers are willing to do so. Such local initiatives resulted in electrification of thousands of communities, particularly in rural areas, that were unserved or underserved by the private sector. The speakers disagreed, however, on whether local governments should also be able to provide broadband service in areas where the private sector is willing to enter. Representatives of local governments maintained that communities should be free to decide this for themselves, particularly if they already operate their own electric utilities and have the infrastructure and expertise necessary to provide broadband service years earlier than the private sector would. Representatives of industry maintained that government should not compete with the private sector and that government provision of broadband may deter private investment and remove demand. Representatives of both public and private overbuilders also expressed concern about predatory practices by incumbent providers.

On right of way issues, CLECs alleged that some local governments have impeded broadband deployment by causing excessive delays in obtaining franchises and building permits and by charging excessive right of way fees. CLECs also believe that there is discrimination in favor of ILECs that impedes broadband deployment and that local governments should only charge actual and direct costs for the use of rights of way. Local governments believe that they have a duty to manage public rights of way in a manner that minimizes damage and multiple disruptions, even if this means in some cases that telecommunications providers must make more thorough applications that they would like. Local governments also believe that undue delays are relatively rare and that the courts are developing standards to which all can look for guidance on what is reasonable in the right of way permitting process. As to fees, local governments would gladly treat ILECs and CLECs similarly but are often precluded by state law from doing so. Local governments also believe that, as trustees for the public, they have a duty to obtain fair value for the public's property and facilities, just as the federal government does when it leases access to federal lands and facilities.

Economic Impact of Broadband

This session concluded that there are 2 competing visions for Broadband deployment.

One model says that there are large externalities to broadband and that there is a role for government in pushing forward on deployment. One analyst has quantified that universal broadband deployment could result in $300 billion in consumer surplus and $100 billion in producer surplus. Others believe that broadband can boost economic productivity through applications like e-government and electronic bill payment. Broadband is not just about new ways of getting media and entertainment.

The second model focuses on consumer demand: if there are applications, consumers will purchase it.

Broadband policy is difficult because of the many uncertainties surrounding deployment. In this environment, regulators should tread softly and should avoid the temptation to regulate services that are competitive.